Time Synchronized Portable Muon Tagger

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IceTop calibration

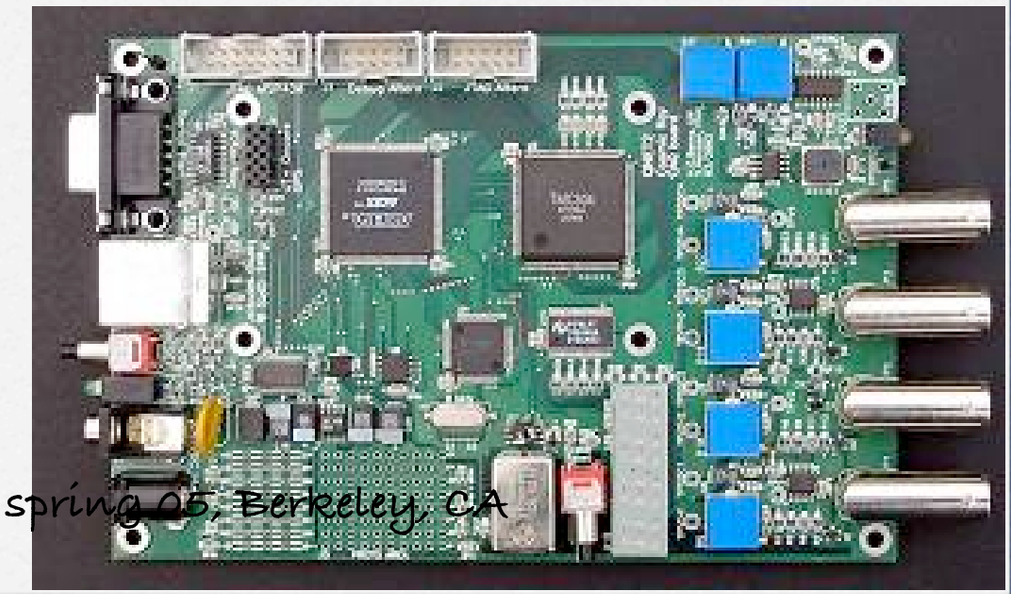
- Muons are nice for calibrating IceTop detectors.
- External telescopes can provide higher certainty single muons.
- No way to integrate external detectors in the IceCube DAQ

The solution!

- Independent gps time synchronized muon trigger to tag muons for offline analysis
- Should be small, low power, portable, easy to use.

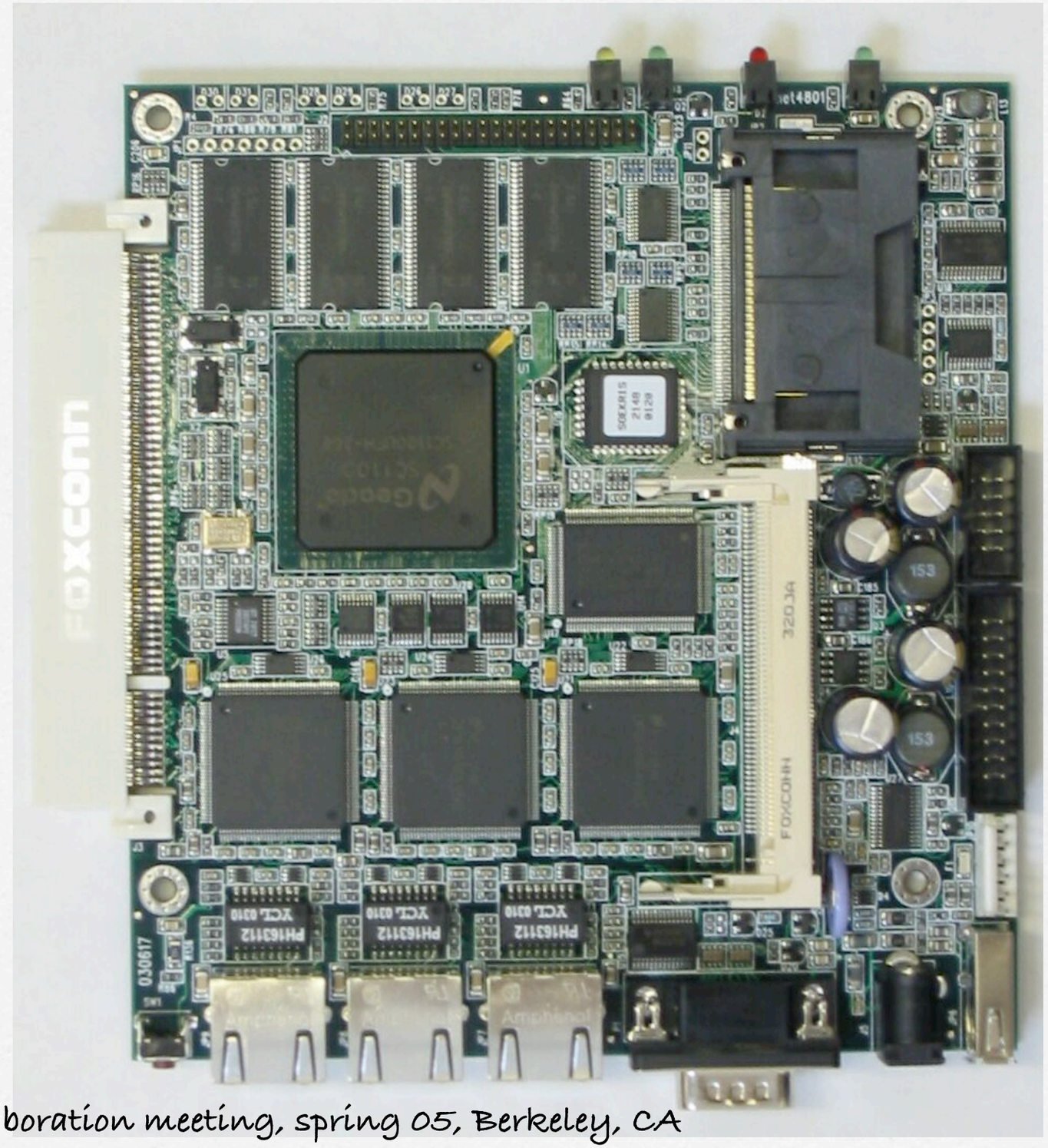
QNET2 DAQ

- Developed by University of Washington for the WALTA cosmic ray experiment.
- 4 input n-fold coincidence with veto
- built in gps synchronization ~100ns jitter
- small, light, low power



Soekris 4801

- Low Power
  (5-10W)
- flash bootable
- 2 serial ports,
  gpio, pci slot, usb



Jonathan Eisch - IceCube Collaboration meeting, spring 05, Berkeley, CA

Current status

- 4801 runs custom FreeBSD with read only file system (memfs /tmp and /var)
- DAQ software controls card, reads settings and records data to usb flash stick (output format?)
- additional daq cards have been ordered
- system control through serial console or ethernet

Still to do...

- [ ] Test entire setup with full icetop station (@ bartol this summer?)
- [ ] Finish making it portable (batteries)
- [ ] Bring it to the pole

The End

Input/Output

- trigger settings provided though text files
- System will begin taking data immediately when booted up, and stop when switched off/loss of power.
- 10 gpio pins available, lots of possibilities for buttons, lights.